

Perceptions of Ohio Teachers Toward Technological Literacy and Efficacy When
Teaching Limited English Proficient Students for Statewide Testing

A Senior Honors Thesis

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BY

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ABSTRACT

The purpose of this study was to generate insights into Ohio's Limited English Proficient (LEP) teachers' attitudes regarding technological literacy and efficacy. The first segment of the study addresses teacher's use, access and knowledge of technology. The second segment evaluates teachers' perceptions of technology used for instruction to support higher achievement towards state wide testing with LEP students. Teachers' technological perceptions of how best to integrate technology, targeted at LEP students, are pivotal to grasping technology's current role. LEP students without access to emerging technologies will continue to be at a disadvantage to their non-LEP counterparts.

This study was descriptive, survey research, and utilized an email/postal survey, consistent with the Dillman (2000) mixed method for survey research. The survey first determined the teacher's technical literacy. The second portion of the questionnaire determined the teacher's ability to use technology in the classroom with LEP students. The target population was kindergarten through twelfth grade teachers currently working in districts that enroll a majority of the LEP students in Ohio.

The random sample included 10 public schools, which collectively enroll over 60% of the LEP students in Ohio. The random sample of 10 (ten) districts included approximately 150 regular elementary and secondary/combined schools. A survey was distributed to Ohio teachers (N= 677) using the Likert scale. The school districts that

responded include: Cincinnati City, Columbus City, Hilliard City, Lakewood City, Painesville Local City, South-Western City, and Westerville City.

The total number of teachers (N=164) that responded was 24% of the sample. The majority of the respondents, 68.3%, were from three school districts: South-Western City (N=50), Columbus City (N=32), Westerville City (N=30).

The results indicated that Ohio teachers have an overall high efficacy when teaching with traditional methods, however, their confidence decreases with the utilization of technologies. Teachers tended to feel comfortable using standard technologies, such as word processing, web searches and utilizing the internet and were most likely to use them in the classroom. However, other technologies such as computer-based training, webinars, chats, databases, and developing html were rarely used. There is also a strong correlation with a teachers' low technical literacy with specific technologies and not implementing the tools in the classroom.

Teachers need additional professional development with existing technologies, such as word-walls and computer based training. It was recommended that additional research needs to identify the effectiveness of additional technologies and to study emerging technologies. Implications from this study suggests, further research in identifying when a teacher can implement technologies to English Language learners and take the role of facilitator or coach. This is especially imperative in school districts with large LEP populations.

DEDICATION

Dedicated

To

Keith Speers, Chris Zirkle, Phillip Lerche, Douglas Miller

And to

My family

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I would like to express my sincerest gratitude to my advisor, Dr. Chris Zirkle, and to my mentor Keith Speers. Dr. Zirkle has endured, encouraged and supported me throughout my studies. His encouragement began my pursuit to complete a doctoral degree. Keith Speers as my mentor has encouraged me for over a decade to complete my degree and continues to inspire and help to guide my work. His genuine care of the educational system is large and he is an inspiration that continues to drive my desire to attain higher educational goals and how to express them through positive change.

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CHAPTER 1

INTRODUCTION

In recent years, technology has changed the very fabric of life and the way industries conduct business, the way we learn, and the way we observe the world. We are currently in the Information Age and the array of methods for acquiring and collecting data seems endless. In *Never Never Underpeople*, (Smith, 1993), humans were given numbers instead of a name; therefore, humans became a commodity. Humans have not become merely numbered beings as in Smith's novel, however, the collection of data on each of us has become one of the most important of society's commodities in analyzing human behavior.

Data is being collected in large data warehouses and analyzed to track everything including marketing trends, and weather patterns. In education, student data is being collected to measure the success and failure rates of schools and student performance. The United States Department of Education (USDOE) instituted the No Child Left Behind Act (NCLB) in 2001. When President Bush signed the No Child Left Behind Act into law, he stated that the law's first principle would be accountability. States would set high standards against which to measure student performance, while the federal government would provide the resources, flexibility and choices needed to make reform

work. Above all, schools would be held accountable for annual progress toward the goal of every student reaching grade level or better in reading and math by 2014. (NCLB, 2001).

The No Child Left Behind Act targets four population subgroups: economically-disadvantaged students, students with disabilities, students with limited English proficiency, and students of diverse backgrounds. Limited English Proficient (LEP) students must be included in each state's assessment system under the new law. In addition, the testing scores of Limited English Proficient students have to be "disaggregated" for reporting to parents, schools and the public and for determining yearly progress.

According to the Department of Education, (2006a), under Title I, local educational agencies are required to provide services for eligible private school students, as well as eligible public school students. The Title I funding which certain schools receive is contingent on following the new LEP assessment statutes in Title III. The Title III program helps eligible Institutional Development and Undergraduate Education Services to become self-sufficient and expand their capacity to serve low-income students by providing funds to improve and strengthen the academic quality, institutional management, and fiscal stability of eligible institutions (U.S. Department of Education, 2006b). Limited English Proficient children account for a growing population in schools and must be included in a state's assessment system.

In addition, The U.S. Department of Education officially released the National Education Technology Plan on Jan. 7, 2005 (U.S. Department of Education, 2006a). The plan required all students to become technology literate by the end of the 8th grade. This

means that basic or introductory technology concepts must be addressed by benchmarks and indicators in the K-2, 3-5, and 6-8 grade bands in order to achieve the No Child Left Behind Act goals.

The No Child Left Behind Act charged the Secretary of Education with the development of the nation's third National Education Technology Plan. The National Education Technology Plan was developed as part of a long-range national strategy and guide for using technology effectively to improve student academic achievement-either directly or through integration with other approaches to systemic reform.

The National Education Technology Plan (2006a) defined the top seven action steps:

1. Strengthen Leadership

- Invest in leadership development programs to develop a new generation of tech-savvy leaders at every level.
- Retool administrator education programs to provide training in technology decision making and organizational change.
- Develop partnerships between schools, higher education and the community.
- Encourage creative technology partnerships with the business community.
- Empower students' participation in the planning process.

2. Consider Innovative Budgeting

- Determine the total costs for technology as a percentage of total spending.
- Consider a systemic restructuring of budgets to realize efficiencies, cost savings and reallocation. This can include reallocations in expenditures on textbooks, instructional supplies, space and computer labs.
- Consider leasing with 3-5 year refresh cycles.
- Create a technology innovation fund to carry funds over yearly budget cycles.

3. Improve Teacher Training

- Improve the preparation of new teachers in the use of technology.

- Ensure that every teacher has the opportunity to take online learning courses.
- Improve the quality and consistency of teacher education through measurement, accountability and increased technology resources.
- Ensure that every teacher knows how to use data to personalize instruction. This is marked by the ability to interpret data to understand student progress and challenges, drive daily decisions and design instructional interventions to customize instruction for every student's unique needs.

4. Support E-Learning and Virtual Schools

- Provide every student access to e-learning.
- Enable every teacher to participate in e-learning training.
- Encourage the use of e-learning options to meet No Child Left Behind requirements for highly qualified teachers, supplemental services and parental choice.
- Explore creative ways to fund e-learning opportunities.
- Develop quality measures and accreditation standards for e-learning that mirror those required for course credit.

5. Encourage Broadband Access

- Thoroughly evaluate existing technology infrastructure and access to broadband to determine current capacities and explore ways to ensure its reliability.
- Encourage that broadband is available all the way to the end-user for data management, online and technology-based assessments, e-learning, and accessing high-quality digital content.
- Encourage the availability of adequate technical support to manage and maintain computer networks, maximize educational uptime and plan for future needs.

6. Move Toward Digital Content

- Ensure that teachers and students are adequately trained in the use of online content.
- Encourage ubiquitous access to computers and connectivity for each student.
- Consider the costs and benefits of online content, aligned with rigorous state academic standards, as part of a systemic approach to creating resources for students to customize learning to their individual needs.

7. Integrate Data Systems.

- Establish a plan to integrate data systems so that administrators and educators have the information they need to increase efficiency and improve student learning.
- Use data from both administrative and instructional systems to understand relationships between decisions, allocation of resources and student achievement.
- Ensure interoperability. For example, consider School Interoperability Framework (SIF) Compliance Certification as a requirement in all Request For Proposals (RFP) and purchasing decisions.
- Use assessment results to inform and differentiate instruction for every child (U.S. Department of Education, 2006a).

Ohio's Academic Content Standards (2006a) in technology are made up of seven standards:

1. Nature of Technology

Students develop an understanding of technology, its characteristics, scope, core concepts and relationships between technologies and other fields.

2. Technology and Society Interaction

Students recognize interactions among society, the environment and technology, and understand technology's relationship with history. Consideration of these concepts forms a foundation for engaging in responsible and ethical use of technology.

3. Technology for Productivity Applications

Students learn the operations of technology through the usage of technology and productivity tools.

4. Technology and Communication Applications

Students use an array of technologies and apply design concepts to communicate with multiple audiences, acquire and disseminate information and enhance learning.

5. Technology and Information Literacy

Students engage in information literacy strategies, use the Internet, technology tools and resources, and apply information-management skills to answer questions and expand knowledge.

6. Design

Students apply a number of problem-solving strategies demonstrating the nature of design, the role of engineering and the role of assessment.

7. Designed World

Students understand how the physical, informational and bio-related technological systems of the designed world are brought about by the design process. Critical to this will be students' understanding of their role in the designed world: its processes, products, standards, services, history, future, impact, issues and career connections (Ohio Department of Education, 2006a).

Ohio has a multi-measure system of accountability for assessing the performance of schools and districts which consists of four major components: State Indicators, Performance Index Score, Performance Index Growth (to be replaced with value-added in 2008 – currently under evaluation), and Adequate Yearly Progress (AYP).

Student achievement is measured using performance data from state tests. Scores on these tests largely determine school and district performance levels. State scores provide information on the student's achievement, however, the state scores do not provide a complete view of the student's growth or progress. Value-added is taking into consideration the starting point to provide a complete view of the student performance.

Value-added analysis is a statistical method used to measure a school's impact on the rate of student progress from year to year. Using this growth metric, schools and districts receive valuable diagnostic information that will help determine the impact of their curriculum and instructional practices on student achievement (Ohio Department of Education, 2006d).

Programs such as The Data Driven Decisions for Academic Achievement (D3A2) project is a long-term initiative focused on developing the capacity of educators while

improving instruction and student achievement. D3A2 will provide systemic access to timely data and educational resources aligned to Ohio's Academic Content Standards through a data bank of technological resources. The data contained in D3A2 is peer reviewed by qualified teachers in a specific field and catalogued for use by teachers if approved (Ohio Department of Education, 2006c).

At this time, value-added analysis will be used as a statewide measure, not as a federal accountability measure. Value-added may be added to AYP in the future, but it will not likely replace other measures. The goal of value-added analysis is to measure student progress from year to year, while AYP's goal is to measure school achievement each year. All of Ohio's data, including state indicators and value-added, can be disaggregated into student groups for analysis, which is helpful for schools and districts wanting to improve.

As described in Table 1, the Performance Index Scores are assigned values of student scores. The scores are designed to show a year's worth of growth. In addition, it will show if students were above, at, or below the state standard. Further, the scores are broken down by state, district, school and individual. Schools are given three years to meet an 'effective' Performance Index Score before they state will intervene.

	Performance Indicators:	Performance Index Score:
Excellent	94–100%	100-120
Effective	75-93%	90-99
Continuous Improvement	50-74%	80-89
Academic Watch	31-49%	70-79
Academic Emergency	0-30%	0-69

Table 1.0: State of Ohio Performance Indicator and Index Score Card

The value-added scores are being evaluated by examining the highest and lowest performing schools. Evaluations are made as to why and how some schools are performing and achieving their current standard. The idea is to learn from the highest and lowest schools in order to close the gap. During the 2006-07 school year, the Ohio Department of Education studied how value-added metrics will be reflected statewide (this is before the value-added measure becomes a part of the accountability system in 2007-08).

The No Child Left Behind growth expectation is still under review. An acceptable achievement threshold has not been set on what constitutes acceptable growth for those schools that are not performing up to expectations. The Ohio Accountability Task Force will make its recommendation on standard growth by summer 2007. The current recommendations identified by the No Child Left Behind include: focus on results, a

focus on proficiency, the establishment of individual standards, the disaggregating of results, and a limited allowance for growth models.

The Ohio State Board of Education continues to propose rules and other changes to the Ohio Administrative Code. Through the Joint Committee on Agency Rule Review of the Ohio General Assembly, the rules likely will be approved the first half of the 2007-08 school year.

Ohio is the second state, behind Tennessee, to adopt value-added. The Ohio Department of Education has not officially adopted this system yet nor has the federal education system adopted the standard. The value-added project is being evaluated and has received positive responses thus far. The Ohio SOAR pilot project is being observed by the Department of Education as part of their examination of the value-added metric calculation.

Background to the research

The Ohio Department of Education recently published the goals for the AYP and the Ohio Graduation Test (OGT) as shown in table 1.1

	Reading:	Math:
3 rd Grade	77.0 %	68.5 %
4 th Grade	74.6 %	73.7 %
5 th Grade	74.6 %	59.7 %
6 th Grade	80.6 %	64.1 %
7 th Grade	74.9 %	57.8 %
8 th Grade	79.0 %	58.0 %

Table 1.1: Average Yearly Progress (AYP) 2007-08 Goals

The 2007-08 Ohio Graduation Test (OGT[10th grade]) goals include reading (77.4 %) and math (68.0 %). The Average Yearly Progress goals include graduation (73.6 %), attendance (93.0 %), and participation (95.0 %).

The school/district will meet Adequate Yearly Progress if the percentage of tested students is at least 95 % (applies to all students and each subgroup), and the percentage of all the students in the tested grade(s) and each of the subgroups at or above the proficient level are above the annual goals set by the state. In addition, they must meet AYP if the percentage all of the students in the tested grade(s) and each of the subgroups are at or above the proficient level and above the annual goals set by the state using a three year

rolling average (when multiple years of test data are available). They can also meet AYP if the subgroup reduces the number of not-proficient students by 10 % annually and is making progress or is above the threshold on the non-test indicators.

Technology has entered almost every facet of the modern classroom with methodologies tied to classroom standards. However, the implementation of technological standards in regards to Limited English Proficient students, remains largely ignored. There is no delineation of technology's role in the standard classroom or applicable methodologies for teaching Limited English Proficient students.

Jeffery Fouts (2000) asserts that cultures and native languages separate who we are, how we speak, how we interact, and how we learn. "Computer and related technologies, when combined with teacher training and support, can be a transformational agent and help create new learning environments. Computers and technology *alone* will accomplish little. How it is used and how a particular program is planned and implemented is equally, if not more, important" (p. 26 & 27).

Fouts (2000) found the following:

Technology can have a positive impact on student achievement. When teachers have appropriate training and a clear purpose technology can create new learning environments. Dependencies include lower student to computer ratio; teacher ownership of the reform efforts; extensive teacher training and planning time; and high levels of technological support.

When combined with traditional instruction, the use of computers can increase student learning in the traditional curriculum and basic skills area.

The integration of computers with traditional instruction produces higher

academic achievement in a variety of subject areas than does traditional instruction alone. Students learn more quickly and with greater retention when learning with the aid of computers. Students like learning with computers, and their attitudes toward learning and school are positively affected by computer use. The use of computers appears most promising for low achieving and at-risk students. Effective and adequate teacher training is an integral element of successful learning programs based on or assisted by technology.

Research in traditional classrooms has shown that technology can have a positive impact on student achievement if certain factors are present, including extensive teacher training and a clear purpose.. In recent years researchers have found that technology can be an important component for creating exciting new learning environments for students; once again, this is dependent on other factors such as: lower student to computer ratio; teacher ownership of the reform efforts; extensive teacher training and planning time; high levels of technological support (Fouts, 2000)

Results are not guaranteed by the introduction of computers and related technology into the classrooms. Other factors such as instructional design and software sophistication also play a role in the process (Fouts, 2000).

The strongest predictor for frequent use of these types of software by academic secondary teachers may be their technical expertise and their use of computers for professional purposes. The second strongest predictor was the extent of professional engagement by the teachers in informal leadership roles at school and in more formal

roles beyond the school. The third strongest predictor was the number of computers in the teacher's own classroom. The teacher's philosophy was the fourth strongest predictor. One could argue that technical expertise compensates for the effects of a teacher's philosophy in that more constructivist teachers are more apt to become expert users of computers. Yet, even with teacher computer expertise taken out of the equations, both classroom computer density and teacher professional engagement are stronger predictors of the teacher's frequent orchestration of student use of these productivity-oriented types of software. (Becker, 2001)

A teacher's computer literacy and efficacy impact a child's education and potential readiness for the workforce. Educational applications currently are not flexible enough to allow for complex structural changes on a per student basis. Webb (2000) completed a study using multimedia in a cooperative learning environment. He concluded that the benefits of using multimedia enhanced the learner's experience, added flexibility to scheduling, and, that organized properly, CBTs could solve some teaching-learning problems while accelerating students' attainment (Webb, 2000).

The National Educational Technology Plan does not define a pedagogical standard when implementing technology. The lack of standards is especially evident when researching Limited English Proficient technologies. Limited English Proficient students are commonly being taught by traditional methodologies that have been used over the last fifty years. Children that do not fluently speak English may be labeled with a learning disability, therefore, many of the children who do not progress to their reading and speaking level drop out of school. A lack of educational focus and understanding on

the emerging and changing markets have put children of foreign cultures further at risk of failure.

Research Problem

Is technology a viable solution where Limited English Proficient students are failing to meet the student achievement annual goals? The No Child Left Behind Act has mandated education for all children regardless of their background or ability. To meet this goal, the state of Ohio is testing the Adequate Yearly Progress (AYP). School and district classifications are now determined by combining results from four measures of effectiveness – performance indicators, performance index, growth calculation, and adequate yearly progress. The AYP places emphasis on subgroup performance. English Language Learners (ELL) along with Racial/Ethnic groups, Economically Disadvantaged and Students with Disabilities are considered part of a subgroup.

According to the Ohio Department of Education, the exclusion of subgroup students is limited to the number of exempt students. Districts are searching for ways to educate this population that includes Limited English Proficient students. Teaching this segment how to meet the AYP standard is adding a required focus to a population of students that may have been receiving inadequate schooling.

Alternative teaching methodologies are being developed to help Limited English Proficient students pass these state-wide tests. Technology is one resource that is currently being tested and implemented. The underlying unknown issue is the use of pedagogical methods used when technology is applied to the value-added curriculum and to the student's overall achievement. According to The Ohio Department of Education, the objective of value-added is "to measure student progress from year to year, while

AYP's goal is to measure school achievement each year. All of Ohio's data, including state indicators, can be disaggregated into student groups for analysis, which is helpful for schools and districts wanting to improve," (Ohio Department of Education, 2006d).

Purpose of the Study

The purpose of this study was to determine perceptions of Ohio teacher's attitudes regarding technological literacy and efficacy when teaching Limited English Proficient Students. Additionally, this research investigated how teachers use technological tools in instruction to support higher achievement towards state wide testing with Limited English Proficient students. Further, this study examined the difference in teachers' attitudes, knowledge and accessibility to technology.

The study focused on five research questions:

1. What is the level of technological literacy of LEP teachers in Ohio?
2. What is the perceived technological expertise of LEP teachers?
3. What are LEP teachers' perceptions of technological instruction with ESL Students?
4. What are the teachers' perceived efficacy regarding the utilization of technology in daily instruction?
5. What is the relationship among the teacher's level of use of technology, expertise and efficacy?

Definitions

Average Yearly Progress (AYP) - AYP stands for Adequate Yearly Progress. This term originated from the federal No Child Left Behind Act of 2001 and the Elementary and Secondary Education Act.

Battelle for Kids - Battelle for Kids is in providing educators with consulting, professional development, training, tools and resources around the effective use of value-added analysis to improve teaching and learning. Battelle for Kids houses one of the largest value-added initiatives in the United States. Battelle for Kids have created a model for implementing value-added at the state, district and school-levels with the ability to connect value-added information to other school improvement initiatives.

Computer Assisted Language Learning (CALL) - is an intercontinental and interdisciplinary journal which leads the field in its dedication to all matters associated with the use of computers in language learning (L1 and L2), teaching and testing. It provides a forum to discuss the discoveries in the field and to exchange experience and information about existing techniques. The scope of the journal is intentionally wide-ranging and embraces a multitude of disciplines.

Submitted articles may focus on CALL and:

- Research Methodologies
- Language Learning and Teaching Methods
- Language Testing Systems and Models
- The Four Skills
- SLA
- HCI
- Language Courseware Design
- Language Courseware Development
- Curriculum Integration
- Evaluation
- Teacher Training
- Intelligent Tutoring
- New Technologies
- The Sociocultural Context
- Learning Management Systems

Council of Chief State School Officers (CCSSO) - The Council of Chief State School

Officers (CCSSO) is a nonpartisan, nationwide, nonprofit organization of public officials

who head departments of elementary and secondary education in the states, the District of Columbia, the Department of Defense Education Activity, and five U.S. extra-state jurisdictions. CCSSO provides leadership, advocacy, and technical assistance on major educational issues. The Council seeks member consensus on major educational issues and expresses their views to civic and professional organizations, federal agencies, Congress, and the public.

The Data Driven Decisions for Academic Achievement (D3A2) - project is a long-term initiative focused on developing the capacity of educators while improving instruction and student achievement. D3A2 will provide systemic access to timely data and educational resources aligned to Ohio's Academic Content Standards.

Developmental Bilingual Education - programs share the goals and duration of Two-Way Bilingual Immersion programs, but offer instruction only to language minority students of one language background (including ELLs).

Elementary and Secondary Education Act (ESEA) - known as the No Child Left Behind Act requires all students to become technology literate by the end of the 8th grade. This means that basic or introductory technology concepts are addressed by benchmarks and indicators in the K-2, 3-5, and 6-8 grade bands in order to achieve the No Child Left Behind Act goal.

English Language Development Assessment (ELDA) - The ELDA is a test product administered by the Council of Chief State School Officers.

English as a Secondary Language (ESL) - Students who second language being learned is English.

English Language Learners (ELL) - A student who is currently in the process of learning English.

Implementation Fidelity - The concept of implementation fidelity, sometimes called adherence or integrity, is a determination of how well the program is being implemented in comparison with the original program design (i.e., is the program being delivered as it was designed and implemented in its efficacy and/or effectiveness trials). There are four primary components examined when considering program fidelity (Dane & Schneider, 1998):

1. Adherence refers to whether the program service or intervention is being delivered as it was designed or written, i.e., with all core components being delivered to the appropriate population; staff trained appropriately; using the right protocols, techniques, and materials; and in the locations or contexts prescribed;
2. Exposure may include any of the following: the number of sessions implemented, length of each session, or the frequency with which program techniques were implemented;
3. Quality of Program Delivery is the manner in which a teacher, volunteer, or staff member delivers a program (e.g., skill in using the techniques or methods prescribed by the program, enthusiasm, preparedness, attitude); and
4. Participant Responsiveness is the extent to which participants are engaged by and involved in the activities and content of the program.

The Joint Committee on Agency Rule Review (JCARR) - was created in 1977 by HB 257 of the 112th General Assembly (RC 101.35). The committee consists of five State

Representatives and five State Senators. In odd-numbered years the chairperson is a House member and in even-numbered years, the chairperson is a Senate member.

The primary function of JCARR is to review proposed new, amended, and rescinded rules to ensure the following:

- the rules do not exceed the scope of the rule-making agency's statutory authority;
- the rules do not conflict with a rule of that agency or another rule-making agency;
- the rules do not conflict with the intent of the legislature in enacting the statute under which the rule is proposed; and,
- the rule-making agency has prepared a complete and accurate rule summary and fiscal analysis of the proposed rule, amendment, or rescission (RC 127.18).

Limited English Proficient (LEP) - Students whose primary or home language is other than English who need special language assistance in order to effectively participate in school instructional programs.

L1 - a students' native language.

L2 - a students' second language.

NCR – Formerly known as National Cash Register. NCR is a Fortune 500 company that sells point-of-sale retails systems, ATMs, and technological services to information technology sectors of large corporations.

Ohio Department of Education's Interactive Local Report Card (iLRC) - The iLRC hosts statewide data on the performance of regions, districts, school, and student performance.

Ohio Department of Education - The Ohio Department of Education is a public office in the state of Ohio that was deigned to oversee and set the direction of the public school system.

Ohio Graduation Tests (OGT) - Assessments aligned to Ohio's Academic Content

Standards in reading, mathematics, science, social studies and writing that students in high school must take to demonstrate proficiency before graduation from high school.

Ohio Test of English Language Acquisition (OTELA) - provides information about score reports that provide information at the student, school, and district level. All four reports provide information about performance in four areas: Listening, Speaking, Reading, and Writing, the four tests students took in the spring of 2006. In addition, the reports include Comprehension scores (based on Listening and Reading) and Composite scores (based on all four tests). Scale scores for Comprehension and Composite are the mean scale scores of the tests that make them up.

Second Language Immersion - taught through academic content programs for ELLs integrate the teaching of English with content area instruction.

Schools online-achievement Reports (SOAR) - Battelle for Kids established a research project titled SOAR to track student achievement scores in students' AYP scores in grades 3 – 8. SAS, analytical software, is the backbone that tracks performance and results of the scores.

Test of English as a Foreign Language (TOEFL) - an Educational Testing Service test of English language proficiency for academic purposes, developed and used primarily for tertiary institutions in the USA.

The Ohio Accountability Task Force - The Ohio Accountability Task Force was created in House Bill 3 to guide the implementation of 'value-added' progress measures into the accountability system and report performance data to school districts and buildings.

Two-Way Immersion - programs promote academic achievement, bilingualism, and biliteracy for ELLs and native English speakers. They typically last for at least 5 or 6 years.

Transitional Bilingual Education - programs offer classes presented in the ELLs' native language for at least 2 or 3 years after which time ELLs receive all-English instruction.

United State Department of Education (USDOE) – The United States Department of Education is a cabinet-level department of the United States government. The USDOE's primary function is to help guide policy and oversee the educational system in the United States.

Unicode - A character code that defines every character in most speaking languages of the world. Typically thought to be a two-byte coding system, Unicode characters can use one byte to four bytes, to hold a Unicode "code point." The code point is a unique number for a character or some character aspect such as a dollar sign "\$" or a hash mark "#". Unicode supports more than a million code points, which are written with a "U" followed by a plus sign and the number in hex; for example, the word "Hello" is written U+0048 U+0065 U+006C U+006C U+006F.

UTF-8 (Unicode Transformation Format-8) - The UTF-8 encoding of Unicode and UCS avoids the problems of fixed-length Unicode encodings because an ASCII file encoded in UTF is exactly same as the original ASCII file and all non-ASCII characters have the bit set (bit 0x80). This means that normal tools for text searching etc. work, and are viewed as expected.

UTF-16 - (Unicode Transformation Format-16) - A two-byte format in the Unicode

coding system and UCS-2, ISO 10646 Equivalent. UCS-2 (Universal Character Set) An ISO/IEC format for coding character sets. ISO/IEC 10646 was synchronized with Unicode; however, Unicode adds additional constraints, and compliance with 10646 does not guarantee compatibility with Unicode.

Value-Added - The fourth component of Ohio's accountability system that measures growth or improvement over a period of time to determine the "value" gained by a student during that time period.

Word-Walls - A word-wall is a systematically structured collection of words displayed on a wall, a web page or other display place in a classroom. Word walls are designed to promote group or individualized learning and be shared by a classroom by structuring words into sentences or phrases.

Summary

The No Child Left Behind Act is the first major educational legislation attempt to provide accountability to all schools across the nation. States, such as Ohio, are focusing on statewide tests, such as the Average Yearly Progress test and the Ohio Graduation Test, to address accountability. To further address student performance, the Ohio Department of Education is working with Battelle for Kids to define the yearly progress of students referred to as value-added under the project name SOAR.

Limited English Proficient students are one of four primary subgroups that were specifically identified in No Child Left Behind. Limited English Proficient students must be included in each state's assessment system under the new law. The scores of Limited English Proficient students are required to be "disaggregated" for reporting to parents, schools and the public and for determining yearly progress. The Title I funding, which

certain schools receive, is contingent on following the assessment statutes in Title III.

Limited English Proficient students account for a growing population in schools, and are accounting for larger potential impact on the state's assessment system.

Ohio teacher's perceptions of how best to utilize technology with Limited English Proficient students is pivotal. Limited English Proficient students without access to emerging technologies will continue to be at a disadvantage to their student counterparts. Therefore, school districts will need to closely monitor how teachers use instruction to support higher achievement towards state wide testing with Limited English Proficient students. This study examined the difference in teachers' attitudes, knowledge and accessibility to technology.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

In seeking to identify technological standards that tie into statewide testing of students who are learning English as a second language, this research has identified practices and standards in the United States and Ohio. This review of literature will examine a variety of pedagogical theories, state and nation-wide technological standards, immersion projects and teaching methodologies as they apply to Limited English Proficient students.

Limited English Proficient Standards

Ohio state school standards and benchmarks are based upon the compilation and synthesis of states that collaborated in the design and development of the English Language Development Assessment (ELDA) during 2003 and 2004. The English Language Development Assessment is a test product administered by the Council of Chief State School Officers (CCSSO). The Ohio Test of English Language Acquisition (OTELA) is a test based on items developed for the English Language Development Assessment.

The current standards and benchmarks compile cognitive abilities in reading, writing, listening and spelling, break the information down by state, ethnicity, and first (primary) language, and address teaching standards without addressing the utilization of technology. K – 12 schools have been slow to incorporate technologies into the classroom environment. Where implementation does occur there is little consistency in evaluating its content, the teachers' use of the tool, and the value-added component.

Globally, the number of LEP students in current classrooms is increasing exponentially. The number of children enrolled as Limited English Proficient is on the increase globally as well as in Ohio. The British Council (2007) estimated that over one billion people are currently learning English worldwide. In 2000 there were 750 million English as a Foreign Language speakers. The U.S. 2000 Census reported 47 million U.S. residents age five and older spoke a language other than English at home. Approximately 4.6 million English Language Learners (ELL) students were enrolled in grades K–12 in 2000-2001 (Kindler, 2002). It is estimated that by 2030 40% of the ELL school-aged students in the United States will need some form of a second language. (Thomas & Collier, 2002).

Computer based training

Computer based training methodologies and studies have been completed in a variety of subjects. Much of the research is focused on the core curriculum such as math, science and reading. Very few studies have been completed on the utilization of technology with Limited English Proficient students.

Webb (2000) completed a study using multimedia in a cooperative learning environment. He concluded that benefits of using multimedia enhanced the learner's

experience, added flexibility to scheduling, and that organized properly computer-based training could solve some teaching-learning problems while accelerating students' attainment.

The Oregon Health and Science University conducted research that tested Latino Immigrants in Dayton, Oregon using computer based trainings. The group of 61 immigrants were L1 learners with very little to no experience using the internet. Findings showed a reluctance to learn to type at first until the test group mastered the standard computer keyboard. The test concluded that all but one person was able to successfully complete the computer based training. The authors also concluded that the training had to be adapted to meet cultural issues such as teaching the learners to use the keyboard. This was done by adapting familiar objects to the keyboard (Anger, 2004).

A study using a constructivist approach to developing and teaching with technology found that the utilization of technology increased the learning experience. However, when instructional programs add complexity to the instructional design, the complexity of the software application also increases. Many of the technological applications did not allow for the flexibility required of the instructor (Liaw, 2004). This conclusion also buttresses the common belief that many teachers do not have the technical knowledge to implement such solutions.

Standards in Selecting Technology Type

The selection criteria of software applications is falling short in defining a standard and is short on research to support a selection process. The Northwest Regional Literacy Resource Center conducted an analysis of technology for ESL users in 1994. The method used was a simple questionnaire on usability from the users' perspective and

was assessed based on a one to five rating scale (Northwest Regional Literacy Resource Center, 1994). However, this report did not include any pedagogical analysis. Selection criteria without considering methodologies on a state-wide or national level could have demonstrative effects such as implementing a tool that does not match teaching methodologies.

An adult computer training research project evaluated the learner's preference of three differing technologies: video, self-paced, and rich media. The conclusion to the study was that each learner had a unique style and preference for learning and that video was not a recommended solution (Harp, Taylor, & Satzinger, 1998). This study is also indicative of the diverse cultural differences of Limited English Proficient learners. The learner's style and cultural background must be considered when developing an educational plan for the child.

The Texas Immersion Project researched the methods on the implications of implanting technology into a classroom. The research focus was on the teacher and student interaction with the technology, however, it did not include any criteria on defining software applications that were utilized by the teacher or students.

The Ohio Department of Education is currently completing a longitudinal study of the Data-Driven Decisions for Academic Achievement (D3A2). The project is Ohio's long-term data system initiative designed to provide systemic access to timely, quality data and educational resources aligned to Ohio's academic content standards and develop the capacity of educators and stakeholders to access, analyze, and use data to improve instruction and student achievement (Ohio Department of Education, 2006c).

The D3A2 project in essence will help facilitate online resources to educators. The online resources are peer reviewed by teachers in corresponding fields. However, it should be noted that the approval process for the content is not based on any scientific based methodologies.

Effects of Learning Environments Type

Thomas and Collier (2002) conducted a study of four program designs: Two-Way Immersion, Development Bilingual Education, Second Language Immersion taught through academic content, and Transitional Bilingual Education (Genesee, 1999). This study concluded that students performed better in a mixed (50/50) environment as opposed to a primarily English only (90/10) school. A 50/50 environment is defined as a blended environment comprised of an even mix of English Language Learners and English speaking students. The mix of 90/10 is comprised primarily of English speaking students with a small ratio of English Language Learners. Those that attended the 50/50 schools tended to perform at regular class level. Those students who attended the primarily 90/10 English speaking schools had a high failure and dropout rate. These tests were conducted as the internet was in its developmental infancy and similar tests have not been conducted since.

Computer Literacy

The US Department of Education has set a standard for computer literacy for 2007/8 stating that all eighth grade students shall be computer literate. The standard does not include any testing method to verify the student's ability.

A recent study by The Educational Testing Network Service (ETS) tested 6300 college students on technological tasks such as using email, identifying sources on the internet and taking tests on the web. 52% of test takers could correctly judge the objectivity of a Web site, and only 65% could correctly judge the site's authoritativeness. In a Web search task, only 40% entered multiple search terms to narrow the results. And when selecting a research statement for a class assignment, only 44% identified a statement that captured the demands of the assignment (Bogen, 2006).

Krashen's Theories on Acquiring a Second Language

Stephen Krashen (1985), is known for his five theories of second language and bilingual language learning. The five hypotheses: Acquisition-Learning, Affective Filter Hypothesis, Monitor Hypothesis, Input Hypothesis, and the Natural Order Hypothesis were constructed in the eighties and have been validated by continued use in current curriculum.

The Acquisition-Learning Theory is two faceted. The theory asserts that second language performance is through either acquisition or a learned system. Acquisition is subconscious and learned through interaction and natural communication in real-world environments. Learning is the conscious process of formal instruction. Krashen contends that the acquisition is more important than learning.

The Affective Filter Hypothesis states that a student's self efficacy and environment plays a critical role in motivation. Self-confidence, self-image, anxiety, and a risk-free environment are factors towards the success of acquiring a second language. The emotional state of the learner will determine the motivation. The more a student feels

comfortable with themselves and their surrounding environment the ability for the student comprehension increases.

The Input Hypothesis is only concerned with acquisition, not learning. The learner moves through the natural order (when they receive second language input that moves them beyond their current stage of linguistic competence). Input Hypothesis can only be promoted in one way, comprehensible input. Messages must be presented or encoded in a way that the message is easily understood, i.e.: pictures, visuals, gestures, and facial expressions work to make language more easily understood.

The Monitor Hypothesis consists of intuitive judgments in learning a second language. Rather than learning rules, the student learns by acquiring skills naturally through the monitor. The monitor acts as an editor and given the appropriate conditions, time, focus and knowledge of the rules, the learner will learn through oral responses. Krashen notes that the emphasis should be on verbal communication not based on rule-learning.

The Natural Order Hypothesis states the acquisition of grammatical structures and follows a natural order which is predictable and occurs in a sequence. Learners regardless of background or age have a tendency to learn in a predictable order.

Principles in Teaching Limited English Proficient Students type

Principle #1: Students need to feel good about themselves and their relationships with others in second language learning situations (Rigg & Hudelson, 1986).

Putting the principle into practice: Foster friendships among Limited English Proficient students and their peers/teachers; promote cooperative learning activities. arrange for peer study partners; use language skills and cultural knowledge of Limited

English Proficient students as resources in the classroom; have students make bilingual dictionaries for different content areas, have students provide information on food, music, dance, games, folk tales, etc.; have students share personal likes and dislikes, provide learning settings in which students feel at ease..

Principle #2: Comprehension naturally precedes production during the process of second language development (Krashen & Terrell, 1983). Putting the principle into practice: Provide comprehensible input within meaningful contexts; give plenty of opportunities to read good literature that is age appropriate and suitable to students' proficiency level, allow students to show comprehension/competency non-verbally, if possible, use students' native language as a means to develop necessary concepts.

Principle #3: Second language competency develops most quickly when the learner focuses on accomplishing tasks rather than focusing on the language itself. (Krashen & Terrell, 1983; Rigg & Hudelson, 1986). Putting the principle into practice: give chances for students to work on group assignments, begin with concrete experiences. Focus on purposeful content-related activities.

Principle #4: Students can learn to read and write in a second language while they develop their oral skills(Rigg & Hudelson, 1986). Putting the principle into practice: use the language experience approach to promote both oral and written communication; provide meaningful writing opportunities, teach note-taking skills, make authentic reading resources available, involve students in journal writing.

Principle #5: Learners acquire a second language through trial and error; mistakes are part of the natural process. (Rigg & Hudelson, 1986; Krashen & Terrell, 1983). Putting the principle into practice: focus on what students communicate rather than on

how they communicate; don't correct students' mistakes all the time, especially when correction interrupts communication; use students' errors as indicators of their progress in developing second language skills.

Texas Technology Immersion Pilot

The Texas Immersion Pilot is an ongoing pilot program around the state of Texas. The project's main goal is to improve a student's scores in math and reading for the Texas Assessment of Knowledge and Skills (TAKS). The project includes analysis of teachers' technological efficacy, the types of technology implemented, technological curriculum used, and student scores where technology has been used to supplement education (Texas Center for Education Research, 2006).

In the study, teachers who were using technology in the immersion schools typically lacked intellectual challenges. Student's scores did not change in the first year study, in some instances the student's scores dropped. The report attributes the drop to a focus on questions that were multiple choice or true and false, thus not utilizing higher order thinking skills. In some instances teachers did not help students to understand the relevance of their experience and spent less time with the students. Another challenge included a teacher's knowledge and efficacy using technology. First year teachers in the immersion schools often lacked proficiency in the utilization of laptops and software applications provided. Male middle school teachers described themselves as the least proficient and attributed the lack of knowledge from a lack of use and low level of technological support for technological integration.

The study found that student self-direction did not have an impact on their performance. The study theorizes and contends that as the child progresses through the

immersion program, the child in later grades will change behavior patterns and be more inclined to use their assigned laptops in better ways than they have been taught for the first year of the project.

The first year of the Texas study was inconclusive. The lower performance of the immersion pilot students was implemented to what the researchers call, implementation fidelity. (Texas Center for Education Research, 2006)

Summary

Studies with Limited Proficient English student's pedagogical use of technology are very limited. A teacher's efficacy and technical literacy is crucial in completing the task of the student learning English. Therefore, better understanding technology's role in society and how students learn will determine how successful they will complete the statewide tests as well as transfer their knowledge into the work place.

CHAPTER 3

METHODOLOGY

Purpose of the Study

The purpose of this study was to determine perceptions of Ohio teacher's attitudes regarding technological literacy and efficacy when teaching Limited English Proficient Students. Additionally, this research investigated how teachers use technological tools in instruction to support higher achievement towards state wide testing with Limited English Proficient students. Further, this study examined the difference in teachers' attitudes, knowledge and accessibility to technology.

Research Questions

The study focused on five research questions:

1. What is the level of technological literacy of LEP teachers in Ohio?
2. What is the perceived technological expertise of LEP teachers?
3. What are LEP teachers' perceptions of technological instruction with ESL Students?
4. What are the teachers' perceived efficacy regarding the utilization of technology in daily instruction?
5. What is the relationship among the teacher's level of use of technology, expertise and efficacy?

Design of the Study

This study was descriptive, survey research, and relied on an e-mail/postal survey. This strategy is consistent with the Dillman (2000) mixed method for survey research, which suggested that a bimodal method increases participation of surveys. This was a five-contact, 25-day model using a web-based and mail survey.

Day 1: pre-notice by e-mail

Day 4: e-mail invitation with hyperlink to survey site

Day 7: e-mail reminder

Day 11: surveys are mailed to non-respondents

Day 15: final reminder by e-mail

Data collection continues for ten additional days.

Email Questionnaire

A brief survey was e-mailed to all teachers defined by the study. The questionnaire first determined the teacher's technical literacy. The second portion of the questionnaire determined the teacher's efficacy utilizing technology in the classroom with LEP students.

Population

The target population in the study was kindergarten through twelfth grade teachers currently working in districts that enroll a majority of the Limited English Proficient students in Ohio.

The frame for this study contains data collected from the Education Management Information System (EMIS) maintained by the Ohio Department of Education. The

EMIS is the Ohio Department of Education's data warehouse. The EMIS system makes public information available on the Ohio Department of Education's web site. The EMIS is a collection of smaller data sets, including the interactive Local Report Card (iLRC).

The teacher data set was retrieved from the EMIS. The questionnaire was emailed and mailed to a representative random sample of ten public schools in the Ohio, that enroll over 60% of the LEP students in Ohio kindergarten through twelfth grade available at the time of selection. The random sample of the ten districts included approximately 150 regular elementary and secondary/combined schools.

Sample

From the 10 school districts, a random sample of teachers was selected, using Microsoft Excel to generate the list. The Excel formula selected a random number between one and 100. A table was constructed with the teachers numbered from one to approximately 150. Excel generated a random number from one to 150 and the individual with the specific number became part of the sample.

Selected survey findings are presented by the following school demographic characteristics: Instructional level (elementary, secondary); school size (enrollment of less than 300, 300 to 999, 1,000 or more, referred to as small, medium, and large throughout the report); percent LEP enrollment (less than six percent, six to 20 %, 21 to 49 %, 50 % or more) reference; and comparisons by school characteristics were identified where measurable differences were detected and follow meaningful patterns.

Data Analysis

Quantitative data (survey data) was analyzed and reported using SPSS.14 for Windows. Table 3.0 shows the research questions in relation to the statistical methods employed.

No.	Research Question	Analysis Procedure
1.	What is the level of technological literacy of by LEP teachers in Ohio.	Descriptive statistics
2.	What is the perceived technological expertise by LEP teachers' use of technology?	Descriptive statistics
3.	What are LEP teachers' perceptions of technological instruction with ESL Students?	Descriptive statistics
4.	What is the teachers' efficacy utilization of technology in daily instruction?	Descriptive statistics
5.	What is the relationship between the teacher's level of use of technology, expertise and efficacy?	Pearson's, Point bi-serial, and Eta correlation

Table 3.0: Statistical analysis used to answer research questions

Ethical Considerations

This study adhered to guidelines of The Family Education Rights and Privacy Act (FERPA) of 1974. The population and sample of teacher data were collected through the Ohio Department of Education through the EMIS database. The EMIS system is an

online system that is available to the general public. Additional resources included the D3A2 project database. No student data were used for the purpose of this study.

Survey Validity

The instrument for this study employed a Likert Scale derived from three studies. *The prospective teachers' sense of efficacy and beliefs about control* (Woolfolk & Hoy, 1990); *Teacher Efficacy: A Construct Validation* (Gibson & Dembo, 1984) and *The Use of the Internet Among EFL Teachers at the College of Technology in Saudi Arabia*. (Al-Asmari, A, 2005). The survey is located in Appendix A and detailed information about the survey methodology is provided in Appendix B. To validate the survey, the questionnaire was sent to a sample group of LEP teachers to conduct a content review of the questions. The reviewer's comments and suggestions were incorporated into the survey instrument where appropriate.

Summary

The purpose of this study was to acquire perceptions of Ohio LEP teacher's attitudes regarding technological literacy and efficacy. Additionally this research addressed how tools teachers use for instruction support higher achievement towards state wide testing with Limited English Proficient students. This study examined the difference in teachers' attitudes, knowledge and accessibility to technology.

CHAPTER 4

RESULTS AND DATA ANALYSIS

Introduction

This chapter reports the findings of the quantitative analysis of data collected through a mixed-mode survey of high school teachers in the state of Ohio. The purpose of this study was to explore the (a) utilization of technology, (b) accessibility to internet and technological resources, (c) efficacy of desktop and internet technologies, and (d) teachers' perceptions of utilizing technologies with English as a Second Language Student.

The target population for this study consisted of a random sample (N=677) of kindergarten through twelfth grade teachers. The teachers were selected from ten school districts in the state Ohio that maintain 60% of the English as a Second Language student population. The school districts that responded include: Cincinnati City, Columbus City, Hilliard City, Lakewood City, Painesville Local City, South-Western City, and Westerville City.

The total number of teachers (N=164) that responded was 24% of the sample population. The majority of the respondents, 68.3%, were from three school districts: South-Western City (N=50), Columbus City (N=32), Westerville City (N=30).

	Frequency	Percent
Cincinnati City School District	8	4.9%
Columbus City School District	32	19.5%
Hilliard City School District	20	12.2%
Lakewood City School District	2	1.2%
Painesville City Local School District	22	13.4%
South-Western City School District	50	30.5%
South-Western City School District	30	18.3%

Table 4.0: Distribution of Respondents by District Name

1. What is the level of technological literacy of by LEP teachers' in Ohio?

How often do you use the following internet services for professional development?	Mean	Standard Deviation	Variance
Electronic-mail (e-mail)	2.32	1.146	1.032
The World Wide Web (WWW)	2.00	1.062	1.129
Forums	4.12	1.008	1.016
Instant Messaging (Messenger)	4.79	.641	.411
Computer based training (CBT)	4.00	1.016	1.031
Word-Walls	4.53	.907	.822
Online Gaming	4.73	.666	.443

Table 4.1: Teacher Technological Literacy

How often do you use the following internet services for personal development?

	Mean	Standard Deviation	Variance
Electronic-mail (e-mail)	1.79	1.024	1.049
The World Wide Web (WWW)	1.86	1.019	1.037
Forums	4.12	1.173	1.376
Instant Messaging (Messenger)	4.58	.861	.742
Computer based training (CBT)	4.21	.975	.950
Word-Walls	4.61	.903	.815
Online Gaming	4.70	.795	.632

Scale: 1 = Very Often, 2 = Often, 3 = Sometimes, 4 = Rarely, 5 = Never Use

Table 4.1.1: Teacher Technological Literacy

A majority of respondents tend to use the web or e-mail for personal and professional development often. Often is defined as 11- 20 hours per week. Tools, such as computer based training (CBT's), forums, or word-words all fell within the Rarely used. Rarely is defined as 1.5 hours per week. The majority (N=144, 87.8%) of respondents reported never using instant messaging and (N= 138, 72%) never use online-gaming. A smaller majority reported (N=66, 40.2%) never use computer based training for additional development.

2. What is the perceived technological expertise by LEP teachers' use of technology?

	Mean	Standard Deviation
Word	3.07	.838
Spreadsheets	2.07	.848
Database	1.42	1.010
Integrated	2.16	.999
Graphics	1.99	.965
Presentation	2.35	1.081
Multimedia	2.02	1.183
Email	3.47	.708
Web	3.43	.820
HTML	1.40	.949
Search Engines	3.32	.820
Download/Upload		
Internet Files	2.98	1.071
Chat Rooms	1.47	1.304
IM	1.55	1.395
Online-Forums	1.32	1.235

Scale: 0 = Never Use, 1 = Beginner, 2 = Intermediate, 3 = Advance, 4 = Expert

Table 4.2: Teacher Technological Expertise

Findings from the survey show that a majority of teachers are proficient to expert with word processing, e-mail, the web, search engines and uploading and downloading

files. Most teachers consider their skills at the intermediate to beginner level when using chat rooms, instant messaging, online-forums, and graphic tools. Additional findings include twenty-eight teachers listed never using databases or HTML to create web pages.

3. What are LEP teachers' perceptions of technological instruction with ESL Students?

How often do you use the following internet services for instructional purposes?

	Mean	Standard Deviation	Variance
Electronic-mail (e-mail)	2.90	1.315	1.729
The World Wide Web (WWW)	2.43	1.045	1.092
Forums	4.48	.571	.326
Instant Messaging (Messenger)	4.78	.546	.298
Computer based training (CBT)	4.05	.904	.817
Word-Walls	4.11	1.326	1.758
Online Gaming	4.22	1.092	1.193

Scale: 1 = Very Often, 2 = Often, 3 = Sometimes, 4 = Rarely, 5 = Never Use

Table 4.3: Technical perceptions utilizing technology

Respondents tend to use the web (N=82, 50.6%) or email (N=68, 42%) as the primary technological tool for instructional purposes. Tools that were never used for instruction included word-walls (N=94, 57.3%), online gaming (N=98, 59.0%), instant messaging (N=134, 81.7%) and computer based training (N=58, 35.4%).

4. What is the teachers' efficacy utilization of technology in daily instruction?

Technical Instruction Question	Mean	Standard Deviation
1. When a Limited English Proficient (LEP) student does better than usually, many times it is because I exert little extra effort.	2.64	0.85
2. I have enough technological training to deal with almost any LEP computer learning problem.	3.41	1.57
3. When an LEP student is having difficulty with an assignment with technology, I am usually able to adjust it to his/her level.	3.14	1.43
4. When a student gets a better grade than he/she usually gets, it is usually because I found better ways of teaching that student using technology.	3.83	1.27
5. When I really try, I can get through to most difficult LEP students using technology.	3.79	1.31
6. Teachers are not a very powerful influence on LEP student's technological achievement when all factors are considered.	4.64	1.14
7. When the grades of my LEP students improve, it is usually because I found more effective technological approaches.	4.11	1.17
8. If an LEP student masters a new concept quickly, this Might be because I knew the necessary steps in teaching that concept using technology.	3.91	1.26
9. If I had more professional technical training I could do more teaching using technology with LEP students in my classroom.	2.94	1.70

Table 4.4 Continued

10. The influences of an LEP student's technological experiences can be overcome by good teaching.	3.09	1.38
11. Even a teacher with good technological teaching abilities may not reach many LEP students.	3.23	1.31
12. If one of my students couldn't do a class assignment using technology, I would be able to accurately assess whether the assignment was at the correct level of difficulty and make adjustments with the technology used.	2.87	1.44
13. If I really try hard, I can get through to even the most difficult or unmotivated LEP students using technology.	3.56	1.38
14. When it comes right down to it, a teacher really can't do much with technology because most LEP student's motivation and performance depends on his or her technical proficiency.	4.61	1.26
15. My teacher training program and/or experience has given me the necessary skills to be an effective teacher using technology with LEP instruction.	3.70	1.47

Scale: 1 = Strongly Agree, 2 = Moderately Agree, 3 = Agree Slightly, 4 = Disagree

Slightly, 5 = Moderately Disagree, 6 = Strongly Disagree

Table 4.4: Teacher Technical Efficacy When using Technology for Instruction

All of the responses ranged between moderately agree and moderately disagree.

Three questions were categorized as moderately agreeing. Teachers overall have a medium to high efficacy when teaching LEP students using standard methods of teaching that do not necessarily require technology. It should be noted in question one the respondents felt the primary motivator was the student and not the teacher. That would pose the question the question of a motivated students' performance by a traditional

classroom teacher versus that of a student who is using technology with a teacher as a coach.

The respondents also indicated a need for additional professional development. Although teachers felt comfortable utilizing certain technology, these questions did not pose specific training technological questions. A further study would have to be conducted to isolate the specific training teachers feel they need in the area of additional professional development.

5. What is the relationship between the teacher's level of use of technology, expertise and efficacy?

		Literacy	Efficacy
Literacy	Pearson Correlation	1	-.037
	Sig. (2-tailed)		.900
	N	14	14
Efficacy	Pearson Correlation	.037	1
	Sig. (2-tailed)	.900	
	N	14	15

Table 4.5: Teacher Literacy and Efficacy Correlations

There is a slight negative correlation to a teacher's technical literacy and their efficacy when it comes to utilizing technology in the classroom, $r = -.037$; revealing a weak correlation between technical literacy and efficacy when teaching English as a

second language students. The Pearson Correlation was used to reveal associations between teacher technical literacy and efficacy.

CHAPTER 5

SUMMARY, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

This chapter is a summary of the study, the findings derived from the results, conclusions and proposes recommendations.

Summary of the Study

The purpose of this study was to determine perceptions of Ohio teacher's attitudes regarding technological literacy and efficacy when teaching Limited English Proficient Students. Additionally, this research investigated how teachers use technological tools in instruction to support higher achievement towards state-wide testing with Limited English Proficient students. Further, this study examined the difference in teachers' attitudes, knowledge and accessibility to technology.

The influx of English as a Second Language (ESL) students into the regular classroom to meet the mandates for No Child Left Behind has created a myriad of issues in classrooms throughout Ohio. In some instances teachers are receiving English as second language students into their classrooms with little professional development or experience on instructional methods in dealing with these specific students. The issue could also be stated for the lack of professional development or experience with utilizing

technology. The technological literacy could extend beyond the instructional purposes for English as a second language into the daily instructional methods used for all students.

Although this study did not specifically emphasize a teachers' overall technical literacy, this survey did look at the basic technical skill-set of commonly used technological tools. Findings suggest that many teachers are still not technically literate or proficient to the extent to where teachers can effectively identify or use many tools readily available for instructional purposes.

This research design was a quantitative study from a mixed-mode survey. The survey was constructed to provide possible insight into the possible explanations to the perceptions and utilization of technology of English as a Second Language teachers. Some of the questions were cross-analyzed to determine a teacher's efficacy and literacy and apply this to the amount of perceived usage in the classroom.

Discussion of the Findings

This study was designed around five questions. This section summarizes key results and provides an interpretation of the results.

Question 1: What is the level of technological literacy of LEP teachers' in Ohio?

The technological literacy instrument evaluated the perceived level of teachers' technical literacy on a five point scale. The scale used ranged from '1' represents "very often" = 21 hours or more per week and '5' represents "never use" = zero hours per week.

Findings indicate that the use of e-mail and web were very consistently and teachers had a high confidence level when using either tool. Teachers also used both

tools for instructional as well as personal and professional development. Their confidence level increased one level to 'very often' for personal development with both e-mail and the web. The remaining tools, such as computer based training, online forums, instant messaging etc, remained unchanged from professional to personal development.

The level of usage of professional and personal development displays a correlation of teachers using what teachers are familiar with, i.e. the internet and e-mail. This finding could infer that teachers are either not being trained to use newer technologies or reinforcement of the newer technologies do not exist. Professional development days for teachers is still commonly delivered through lecture or workshops and are primarily text and teacher-driven. The utilization of computer based training, online forums and virtual workshops are not common methods utilized for professional teacher development.

As part of this survey, when teachers were asked about access to the internet or equipment, the response rate indicated that teachers almost always had access to equipment and good internet connections. The only negative response was a lack of time to access the internet.

Question 2: What is the perceived technological expertise by LEP teachers' use of technology?

The level of technological expertise by teachers' in Ohio was represented by a 5-point scale. '0' representing a minimum score of never using the technology and '4' representing a maximum score by an expert level user.

Teachers responded to maintaining intermediate to advanced skills with regard to the majority of static technological tools, such as word processing, presentation software, spreadsheets, browsing the web and email. Few teachers declared themselves experts in any particular area except for browsing the web and e-mail. Teachers maintained an intermediate skill-set with interactive technologies such as integrated software - tutorials and multi-media presentation software. Development technologies, such as databases, graphics, and creation of web pages all scored at the beginning level. It should be noted that in regards to databases and html many teachers scored their technical literacy as never using the tools.

It could be ascertained that the more difficult the technological tool, or perceived difficulty of the technology, the less likely the teacher is to use the tool for instructional or personal use. There were similarities in how teachers also responded to the utilization of specific technologies for instructional, professional and personal development. A majority of teachers responded to using e-mail and browsing the web. The same correlation applied to not implementing certain technologies when a low technical literacy existed. The utilization of instant messaging, computer based training, online forums and interactive media such as online gaming all scored low on development and literacy.

The results reveal that teachers use what they are familiar with and how they have been trained. Traditional instructional methodologies for professional development are passed along in the classroom. Many emerging or existing technologies that could be beneficial for instructional purposes may not be used or are under-utilized.

Question 3: What are LEP teachers' perceptions of technological instruction with ESL students?

Teachers responded to using the same tools for instructional purposes with students as they used for themselves thus reinforcing the practice of using what they are familiar with or have been trained to use. The only difference between teachers' professional and personal development and instructional methods with students was that teachers tend to use the internet slightly more than e-mail for instructional purposes with students.

The remaining technologies listed in the survey are rarely used for instructional purposes. Tools designed specifically for English as a second language, such as word-walls, were listed as being used rarely for instructional purposes. The Texas Assessment of Knowledge and Skills pilot program noted that teachers using technology for instructional purposes lacked either the hardware or application skills to use the technologies effectively. In some instances it was inferred that student scores may have dropped due to the lack of intellectual student challenges and higher thinking skills from the technology used. A teacher's technical knowledge and efficacy were cited as one potential reason for the decline in scores (Texas Center for Education Research, 2006).

Question 4: What is the teachers' efficacy utilization of technology in daily instruction?

Teacher's maintained a mid-range efficacy regarding the utilization of technology for instructional purposes. Questions pertaining to teacher effectiveness of technology with instruction improving performance of English as a second language student typically

ranged between a score of '3' - Agree Slightly More than Disagree, and '4' - Disagree Slightly More than Agree.

Teachers responded to having the basic skills to provide instruction with technology. The lack of a strong response of either maintaining or not having the skills to use technology were also apparent in the response to the utilization of technologies in the classroom, i.e. the internet and e-mail. If additional technologies had been cited as being used, the scores for efficacy should have increased. The lack of utilizing simple effective technologies, such as word-walls and computer based training is indicative of the need for teacher training to implement these technologies.

The only deviation from the midrange were questions pertaining specifically to their belief that additional professional development and training would increase their ability to use technology for instruction; the respondents '2' - Moderately Agreed that they could use more training.

Question 5: What is the relationship between the teacher's level of use of technology, expertise and efficacy?

A Pearson Correlation was calculated to reveal associations between teacher technical literacy and efficacy. A negative relationship ($r = -.037$) was found, revealing a weak correlation between technical literacy and efficacy when teaching English as a second language students. The weak correlation is consistent with findings from the Texas Center for Education Research technological immersion project (2006) where teachers had access to technology, however, many teachers did not have the training to effectively use the technology. One of the side effects in Texas included student scores

decreasing (Texas Center for Education Research, 2006). The survey questions regarding the need for professional development all scored within the “Moderately Agree” category suggesting there is a strong desire and need to increase technological skills.

Conclusion

Based on this study, the majority of teachers maintain a moderate confidence in their ability to teach English as a second language students when using technology. However, this association only applies to the technologies and applications teachers are proficient with.

The less proficient a teacher is with a technology, the less likely the teacher is to implement the tool for instructional purposes. The same finding was reported in a study by Becker in 2001. His findings reported that the less expertise a teacher had with technology the less likely the teacher was to use the tools. The only exception to this was with vocational teachers (Becker, 2001).

Teachers may be unaware of useful technologies, such as word-walls, or lack the knowledge or efficacy to apply technologies in the classroom. Time is also a factor, reported by some teachers, restricting opportunities that could be used to develop the skills necessary to use newer technologies.

Response ratings to utilizing tools such as computer based training, online forums, and instant messaging were very low. Krashen (1989) cites as part of his Input Hypothesis study, that student spelling comprehension can increase without formal instruction. Krashen's Alternative Hypothesis also concluded that by using self-help vocabulary-building books, and listening to vocabulary tapes improved, without proper instruction (Krashen, 1989). New technologies such as instant messaging allow students to communicate and display misspelled words while typing. Using supplemental tools, such as a word-wall, allow English as a second language students the ability to construct sentences while using a form of communication. Tools such as instant messaging and

computer based training could prove to be very valuable in rural areas where a teacher may not have the background in the student's native language.

The lack of technical literacy also poses the question of whether or not the technology is being used. The state of Ohio does provide a set of generic standards on how technology should be used throughout the Academic Content Standards. However, it does not provide detailed content or pedagogical content and training.

Recommendations

Newer technologies are emerging at a rapid rate. It is not realistic to expect teachers to keep up on the latest technological trends or maintain a skill-set at the same rate technologies are emerging. It could be assumed with respect to technology, that teachers use what they are proficient with, and students with access to technology are at a technological literacy advantage. Determining where teacher and student skills mesh could be the short-term determining factor on how best to educate English as a second language students.

Teachers need to maintain a certain level of technological literacy and to be provided with guidelines on how to become facilitators with technologies. It would be unrealistic to assume that teachers need to be expert users of all technologies. It should also be assumed that technologies being used have been simplified to allow for easy instructional implementation and ease of student use.

To provide a business-world example, a simple rule of thumb used in developing technologies at NCR included the philosophy developed from working with sales people and applying human factors. A developer should develop an interface that an individual

with limited technological skills could use. If a sales manager wanted salespeople to use an application to update data, the application would have to be developed so the user would have to do the least amount of the thinking to perform the update. The logic used to build the interface should never leave questions on how to use the technology. Rather, the logic built into the application should be built into the students learning style. If the application interface allows the user to intuitively navigate through the application, the greater the likelihood the teacher will implement or be able to support the student using the application. In addition, if the student is unable to navigate the application the user will become frustrated and thus focus their attention away from learning the content and focus on how to use the application instead, thus defeating the purpose of using technology for teaching the specific skill required.

Teaching the teacher fundamental technological human factor skills of how people use technology will assist in the selection of technologies for student use as well as helping teachers comprehend what is required of them to learn about the technologies while increasing their technological literacy and efficacy. Teachers need to be responsible for scholastic content and implementation of technology as a facilitator, not as a technological guru.

Technologies can be an effective tool in teaching English as a Second Language students. The development of tools that use technologies, such as UTF-8 and UTF-16, allow interfaces to be translated into multiple languages as well as spell checking. . Using theories, such as Krashen's input and output hypothesis, and studying the human factors utilization of the internet and emerging technologies into a structured learning environment is essential in understanding not only how the English as a second language

learner learns but how the instructor adapts the learning technique and tools to the emerging and growing onslaught of technologies.

Recommendations for Further Study

1. There is a need to understand the relationship between teacher technical literacy and efficacy. The low negative relationship is not clearly defined. Teacher interviews and observations should be conducted to conclude if teachers may lack the technical skills, the understanding, exposure, or literacy on using technology.
2. Technological professional development standards are not clearly understood. It is not clear whether teachers have been effectively trained to use technologies for specific student populations, such as English as a Second Language. As results in the Texas immersion project have shown that in some instances grades decreased when technology was implemented. It is not clear if it was the technology, teacher or instructional methods used, that caused the decrease.
3. Research does not exist that has identified existing technologies effective as an educational resource and for use in training with English as a Second Language students. A study needs to be conducted to analyze effective existing technologies and identify emerging technologies.
4. A study needs to be conducted to identify the effects of a lack of teacher efficacy in regards to technical literacy. It is not clear if students are at a disadvantage by a teacher's lack of technical literacy. It is also not clearly understood if the aging teaching workforce maintains a certain sense of prejudice towards the utilization of technology versus the traditional methodologies.
5. A study needs to be conducted to determine where technology, such as virtual classrooms and messaging technology, most appropriately fits within the structure of a classroom when teaching English as a second language students.

REFERENCES

Al-Asmari, A. (2005). *The use of the internet among EFL teachers at the college of technology in Saudi Arabia*. Unpublished thesis, The Ohio State University, Columbus, Ohio. Appendix A, 172-174.

Anger, K., Tamulina, A., Uribe, A., & Alaya, C. (2004). Computer-based training for immigrant Latinos with limited formal education. *Hispanic Journal of Behavioral Sciences*, 26 (3), 373-389.

Becker, H. (2001, April). How are teachers using computers in Instruction? Paper presented at the *American Educational Research Association*, 15-17.

Bogan, K., (2006, Feb.). *College Students Fall Short in Demonstrating the ICT Literacy Skills Necessary for Success in College and the Workplace*. Educational Testing Service. Retrieved October, 3, 2006, from <http://www.ets.org/portal/site/ets/menuitem.c988ba0e5dd572bada20bc47c3921509/?vgnextoid=340051e5122ee010VgnVCM10000022f95190RCRD&vgnextchannel=d89d1eed91059010VgnVCM10000022f95190RCRD>

Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: are implementation effects out of control? *Clinical Psychology Review*, 18, 23-4.

Dillman, D. (2000). The role of behavioral survey methodologists in national statistical agencies. *International Statistical Review / Revue Internationale de Statistique*, 68(2), 200-213.

Ernst & Young (1999). *The knowledge economy*. Retrieved October 5, 2006, from http://www.med.govt.nz/templates/MultipageDocumentPage____17263.aspx

Fouts, J. T. (2000, February). *Research on computers and education: Past, present and future*. Seattle, WA: Bill and Melinda Gates Foundation. Retrieved October 7, 2006, from: <http://www.gatesfoundation.org/reports.html>

Genesee, F. (Ed.) (1999). *Program alternatives for linguistically diverse students (Educational Practice Rep. No. 1)*. Santa Cruz, CA and Washington, DC: Center for Research on Education, Diversity & Excellence. Retrieved October 10, 2006, from www.cal.org/crede/pubs/edpractice/EPR1.pdf

Harp, C., Taylor, S., & Satzinger, J. (1998). Computer training and individual differences: When method matters. *Human Resource Development Quarterly*, 9(3), 271-283

Kindler, A. (2002). Survey of the states' limited English proficient students and available educational programs and services 2000-2001 summary report. Washington, DC: National Clearinghouse for English Language Acquisition. Retrieved October 10, 2006, from <http://www.ncela.gwu.edu/ncbepubs/reports/index.htm>

Krashen, S. (1981). *Second language acquisition and second language learning*. New York, NY: Pergamon Press.

Krashen, S. (1987). *Principles and practice in second language learning and acquisition*. Oxford: Oxford University Press, Inc.

Krashen, S. (1989). *Language acquisition and language education*. New York: Prentice Hall.

Krashen, S. (1989). We acquire vocabulary and spelling by reading: Additional evidence for the input hypothesis. *The Modern Language Journal*, 73, 4, pp. 440-464.

Krashen, S., & Terrell, T. (1983). *The natural approach: Language acquisition in the Classroom*. Hayward, CA: Alemany Press.

Krejcie, R.V., & Morgan, D.V. (1970). Determining sample size for research activities. *Educational and Psychology Measurement*, 30, 607-610.

Leiner, B., Cerf, V., Clark, D., Kahn, R., Kleinrock, L., Lynch, D., Postel, J., Roberts, L., & Wolff, S. (2006). *A brief history of the internet*. Retrieved October 10, 2006, from <http://www.isoc.org/internet/history/brief.shtml#Introduction>

Liaw, S. (2004). Considerations for developing constructivist web-based learning. *Int'l J of Instructional Media*, 31(3).

Ohio Department of Education. (2006a). *Academic content standards*. Retrieved December 22, 2006, from <http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=339&Content=12663>

Ohio Department of Education. (2006b). *NCLB, testing, accountability, and achievement gaps*. Columbus, Ohio: Author Chester, M.

Ohio Department of Education. (2006c). *The data-driven decisions for academic achievement (D3A2) project is Ohio's long-term data system initiative*. Retrieved January, 5, 2006, from <http://nces.ed.gov/Programs/SLDS/PDF/ohioabstract.pdf>.

Ohio Department of Education. (2006d). *Understanding & using value-added analysis - A toolkit for school leaders*. Retrieved January, 5, 2006, from <http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=117&ContentID=17029&Content=19804>

Rigg, P., & Hudelson, S. (1986). One child doesn't speak English. *Australian Journal of Reading*, 9(3), 116-125.

Smith, C. (1993). *Never never underpeople: Cordwainer Smith's humanity*. *Extrapolation* 34 (1993): 123-30.

The NEA Research Bulletin. (1960, December). Small-sample techniques. *The NEA Research Bulletin*, 38, 99.

Texas Center for Education Research. (2006). *eTxTip, evaluation of the Texas technology immersion pilot*. First year results. Retrieved November, 5, 2006, from <http://www.etxtip.info/>

The Northwest Regional Literacy Resource Center. (1994). *ESL technology user's guide*. Retrieved October 10, 2006, from <http://www.kftrkf.hu/egyseg/ID/CNN%20Stories/literacynet.org/nwrlrc/itibsibook.pdf>

Thomas, W., & Collier, V. (2002). *A national study of school effectiveness for language minority students' long-term academic achievement*. Santa Cruz, CA and Washington, DC: Center for Research on Education, Diversity & Excellence. Retrieved October, 22, 2006, from http://www.crede.ucsc.edu/research/llaa/1.1_final.html

U.S. Department of Education. (2006a). *The National Education Technology Plan*. Retrieved December, 18, 2006, from <http://www.ed.gov/about/offices/list/os/technology/plan/2004/site/edlite-actionsteps.html#leadership>

U.S. Department of Education. (2006b). *Elementary and secondary education. Improving basic programs operated by local education agencies (Title I, Part A)*. Retrieved January 12, 2006 from <http://www.ed.gov/programs/titleiparta/index.html>.

U.S. Department of Education. (2006c). *Elementary and secondary education. Title III Part A. Programs strengthening institutions*. Retrieved January 12, 2006 from <http://www.ed.gov/programs/idedtitle3a/index.html>

Webb, J., (2000). *Benefits of cooperative learning in a multimedia environment*. Carbondale, IL: South Illinois University, Department of Workforce Education and Development.

Yi, Y. (2005). *Immigrant students' out-of-school literacy practices: A qualitative study of Korean students' experiences*. Unpublished thesis, The Ohio State University, Columbus, Ohio.

Woolfolk, A. E., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology*. 82, 81-91.

APPENDICIES

APPENDIX A
TECHNICAL SURVEY

The purpose of this study is to acquire attitudes concerning these statements. There are no correct or incorrect answers. Your responses will remain confidential. Your participation is voluntary. You are not required to any of the questions. By answering any of the questions in the survey you are providing your consent to use your responses for this study.

PART ONE: USE OF THE INTERNET *

Instructions: Please identify your access to the internet by checking the appropriate box. Please use the following scale to reflect the access by how many hours per week:

- Never = zero hours per week
- Rarely = 1-5 hours per week
- Sometimes = 6-10 hours per week
- Often = 11-20 hours per week
- Very often = 21 or more hours per week

How often do you use the following internet services for instructional purposes (*e.g. your lessons*)?

	Never	Rarely	Sometimes	Often	Very Often
a. Electronic-mail (e-mail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The World Wide Web (WWW)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Forums	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Instant Messaging (Messenger)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Computer based training (CBT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Word-Walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Online Gaming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you use the following internet services for professional development purposes (*e.g., to locate information*)?

a. Electronic-mail (e-mail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The World Wide Web (WWW)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Forums	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Instant Messaging (Messenger)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Computer based training (CBT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Word-Walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Online Gaming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you use the following internet services for personal development (*e.g. communication or development*)?

	Never	Rarely	Sometimes	Often	Very Often
a. Electronic-mail (e-mail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The World Wide Web (WWW)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Forums	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Instant Messaging (Messenger)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Computer based training (CBT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Word-Walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Online Gaming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART TWO: ACCESS TO THE INTERNET *

Do you have access to the internet?

No (if no, please skip to part three) Yes (if yes, please continue with Part Two)

Instructions: Please identify your access to the internet by checking the appropriate box. Please use the following scale to reflect the access by how many hours per week:

Never = zero hours per week
Rarely = 1-5 hours per week
Sometimes = 6-10 hours per week
Often = 11-20 hours per week
Very often = 21 or more hours per week

How often do you have access to the internet at these places?

	Never	Rarely	Sometimes	Often	Very Often
a. in your home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. in your office	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. in the classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. in a computer lab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. in an internet café	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do the following factors limit your access to the internet?

a. Hardware not working or outdated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Too many people use the computer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Internet connection is always busy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Server down.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Internet connection too slow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Lack of time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Cost of internet service.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART THREE: EXPERTISE IN COMPUTER AND INTERNET USE *

Instructions: Please identify your level of proficiency in using the following computer and Internet applications below by selecting the appropriate box. Please include the following scale:

Beginner = is a less frequent computer and Internet user who can slowly navigate through a computer's operating system in order to open, edit and create files, but does not know how to troubleshoot and solve problems.

Intermediate = is a frequent computer and internet user who feels at ease with the keyboard and mouse. The intermediate user can quickly and easily navigate through the computer's technology and troubleshoot and solve small problems.

Advanced = is a daily computer and Internet user who can quickly and easily navigate through a computer's operating system as well as open, edit and create files, and has a fairly good foundation in most computer and Internet applications and has relatively expertise in troubleshooting and solving bigger problems.

Expert = is a daily and regular Internet user who can quickly and easily navigate through a computer's operating system as well as open, edit, and create files, and has a solid foundation in almost all computer and Internet applications and has solid expertise in troubleshooting and solving major problems.

Never Use = is one who is not familiar with an application.

Computer Base Skills:

	Beginner	Intermediate	Advanced	Expert	Never Use
a. Word Processing (e.g., Microsoft Word)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Spreadsheets (e.g., Excel)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Database Management (e.g., Access)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Integrated software (e.g., drills, tutorials)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Graphics (e.g., Photoshop)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Presentation Software (e.g., PowerPoint)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Multimedia Presentations (e.g., DVD)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Internet Skills Include:

	Beginner	Intermediate	Advanced	Expert	Never Use
a. Receive and send email	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Browse the World Wide Web (WWW)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Create a Web Page (HTML)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Use a search engine (Yahoo, Google)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Upload/download files from the internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Participate in an online chat room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Instant Messaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Participate in an on-line forum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART FOUR: TEACHER EFFICACY 1

INSTRUCTIONS: Please indicate your personal opinion about each statement by circling the appropriate response at the right of each statement.

KEY: 1=Strongly Agree 2=Moderately Agree 3=Agree slightly more than disagree
4=Disagree slightly more than agree 4=Moderately Disagree 6=Strongly Disagree

1. When an LEP student does better than usually, many times it is because I exert a little extra effort.	1 2 3 4 5 6
2. I have enough technological training to deal with almost any LEP computer learning problem.	1 2 3 4 5 6
3. When an LEP student is having difficulty with an assignment with technology, I am usually able to adjust it his/her level.	1 2 3 4 5 6
4. When a student gets a better grade than he/she usually gets, it is usually because I found better ways of teaching that student using technology.	1 2 3 4 5 6
5. When I really try, I can get through to most difficult LEP students using technology.	1 2 3 4 5 6
6. Teachers are not a very powerful influence on LEP students technological achievement when all factors are considered.	1 2 3 4 5 6
7. When the grades of my LEP students improve, it is usually because I found more effective technological approaches.	1 2 3 4 5 6
8. If an LEP student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept using technology.	1 2 3 4 5 6
9. If I had more professional technical training I could do more Teaching using technology with LEP students in my classroom.	1 2 3 4 5 6
10. The influences of an LEP student's technological experiences can be overcome by good teaching.	1 2 3 4 5 6
11. Even a teacher with good technological teaching abilities may not reach many LEP students.	1 2 3 4 5 6
12. If one of my students couldn't do a class assignment using technology, I would be able to accurately assess whether the assignment was at the correct level of difficulty and make adjustments with the technology used.	1 2 3 4 5 6
13. If I really try hard, I can get through to even the most difficult or unmotivated LEP students using technology.	1 2 3 4 5 6
14. When it comes right down to it, a teacher really can't do much with technology because most LEP student's motivation and performance depends on his or her technical proficiency.	1 2 3 4 5 6

15. My teacher training program and/or experience has given me the necessary skills to be an effective teacher using technology with LEP instruction.

1 2 3 4 5 6

*Al-Asmari, A. (2005). *The use of the internet among EFL teachers at the college of technology in Saudi Arabia*. Unpublished thesis, The Ohio State University, Columbus, Ohio. Appendix A, 172-174.

1 From Woolfolk, A. E., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology*, 82, 81-91. Originally based on the Teacher efficacy scale developed by S. Gibson & M. Dembo (1984). Teacher efficacy: a construct validation. *Journal of Educational Psychology*, 76, 569-582.

APPENDIX B
SAMPLE SIZE CALCULATION

TABLE 1
Table for Determining Sample Size from a Given Population

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size.
S is sample size.

FORMULAE FOR DETERMINING NEEDED SAMPLE SIZES

POPULATION SIZE UNKNOWN:

$$\text{SAMPLE SIZE} = \frac{\left(\frac{\text{RANGE}}{2} \right)^2}{\left(\frac{\text{ACCURACY LEVEL}}{\text{CONFIDENCE LEVEL}} \right)^2}$$

Confidence Levels:

	α	$\alpha/2$
.10 level =	1.28	1.64
.05 level =	1.64	1.96
.01 level =	2.33	2.58
.001 level =	3.09	3.29

Accuracy Levels:

Range X	Desired Level of Accuracy (expressed as a proportion)
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POPULATION SIZE KNOWN:

$$\text{SIZE} = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P (1-P)}$$

X^2 = table value of Chi-Square @ $d.f. = 1$ for desired confidence level

.10 = 2.71 .05 = 3.84 .01 = 6.64 .001 = 10.83

N = population size

P = population proportion (assumed to be .50)

d = degree of accuracy (expressed as a proportion)

The NEA Research Bulletin, (1960, December). Small-Sample Techniques. *The NEA Research Bulletin*, 38, 99.

APPENDIX C
PRE NOTICE LETTER

Dear:

Greetings from The Ohio State University and the College of Education and Human Ecology. I am conducting a statewide study of Limited English Proficient teachers. Within the next five days I will be sending you a link to a very brief survey, with instructions, so I may ascertain your examine your professional attitude, knowledge and accessibility to technology with Limited English Proficient Students.

Your responses are completely confidential and your participation is completely optional, but obviously we would like your input. If you have any questions regarding the survey questionnaire, please contact me at (614) 203-1457 or through email at henry.347@osu.edu. I will be happy to answer them.

Sincerely,

Brad A. Henry

Undergrad Student, Career and Technical Education

Chris Zirkle, Ph.D.

Assistant Professor

APPENDIX D

EMAIL CORRESPONDENCE

Dear:

Greetings from The Ohio State University and the College of Education and Human Ecology. I am conducting a statewide study of Limited English Proficient teachers. I am sending you a link so I may ascertain your examine your professional attitude, knowledge and accessibility to technology with Limited English Proficient Students.

Enclosed you will find a link to a survey questionnaire, which should take no more than 15 minutes to complete. The survey questionnaire asks questions about your use, access and expertise with technology, and your attitude and perceptions on the utilization of technology when teaching Limited English Proficient students.

Your responses are completely confidential. Your answers will not be shared with anyone other than the study personnel (myself and my academic professor). There is a survey number on the questionnaire so we may keep track of those individuals who have completed the questionnaire. Your participation is completely optional, but obviously we would like your input.

If you have any questions regarding the survey questionnaire, please contact me at (614) 203-1457 or through email at henry.347@osu.edu. I will be happy to answer them.

In order to finish the study soon, we would like your response by May 5, 2007. Thank you.

Sincerely,

Brad A. Henry

Undergrad Student, Career and Technical Education

Chris Zirkle, Ph.D.

Assistant Professor

APPENDIX E

MAIL REMINDER

Dear:

Greetings from The Ohio State University and the College of Education and Human Ecology. This letter is a second attempt to reach you in regards to my study. I am conducting a statewide study of Limited English Proficient teachers. I am sending you a link so I may ascertain your examine your professional attitude, knowledge and accessibility to technology with Limited English Proficient Students.

Enclosed you will find a link to a survey questionnaire, which should take no more than 15 minutes to complete. The survey questionnaire asks questions about your use, access and expertise with technology, and your attitude and perceptions on the utilization of technology when teaching Limited English Proficient students.

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Sincerely,

Brad A. Henry

Undergrad Student, Career and Technical Education

Chris Zirkle, Ph.D.

Assistant Professor

APPENDIX F

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In order to finish the study soon, we would like your response by May 5, 2007. Thank you.

Sincerely,

Brad A. Henry

Undergrad Student, Career and Technical Education

Chris Zirkle, Ph.D.

Assistant Professor